

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

REMARKS/ARGUMENTS

Applicants amended the specification to substitute U.S. application serial numbers for attorney docket numbers.

The Examiner rejected claims 1-42 as obvious (35 U.S.C. §103) over Bar (2003/0016624) and Ben-Ami (U.S. Patent No. 6,301,267). Applicants traverse for the following reasons.

Claims 1, 15, and 29 concern selecting one of multiple data paths to a device and require: selecting one of multiple paths indicated as enabled to transmit data, wherein a path is indicated as enabled or disabled; gathering transfer time data for each enabled path capable of being selected; and indicating paths as disabled having transfer time data satisfying a threshold, wherein paths indicated as disabled are not capable of being selected to use to transmit data.

The Examiner found that col. 3, lines 31-41 of Ben-Ami taught the claim requirements of gathering transfer time data for each enabled path capable of being selected; and indicating paths as disabled having transfer time data satisfying a threshold, wherein paths indicated as disabled are not capable of being selected to use to transmit data. (Office Action, pg. 2)

The cited col. 3 discusses allocating traffic by selecting a candidate route, and how to search for a switch which would be blocking at the service level if the inactive link were activated, and which would cause the switch to not be blocking if the current inactive link were activated.

Nowhere does the cited col. 3 of Ben-Ami anywhere teach or suggest or mention the claim requirement of gathering transfer time data for each enabled path capable of being selected. Further, nowhere does the cited col. 3 mention anything about gathering transfer time data or indicating paths as disabled having transfer time data satisfying a threshold. Instead, the cited col. 3 concerns how to select a switch that although blocking at the service level has an unused active link which if activated would not be blocking at the service level. Applicants submit that this cited col. 3 does not teach, suggest, mention or concern the claim requirements of gathering

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

transfer time data and indicating paths as disabled having transfer time data satisfying a threshold.

Thus, although the cited Ben-Ami describes a technique for selecting paths based on whether they have an unused active link, nowhere does the cited Ben-Ami teach or suggest the particular claimed techniques for selecting a path, which includes gathering transfer time data and indicating paths as disabled having transfer time data satisfying a threshold.

Accordingly, claims 1, 15, and 29 are patentable over the cited art because the cited art does not teach or suggest all the claim requirements.

Dependent claims 2-14, 16-28, and 30-42 are patentable over the cited art because they depend from one of claims 1, 15, and 29, which are patentable over the cited art for the reasons discussed above. Moreover, certain of the below discussed dependent claims provide additional grounds of patentability over the cited art.

Claims 2, 16, and 30 depend from claims 1, 15, and 29 and further require indicating one disabled path as enabled after performing a threshold number of transfer operations. The Examiner cited col. 34, lines 63-67 of Ben-Ami as teaching the additional requirements of these claims. (Office Action, pg. 3). Applicants traverse for the following reasons.

The cited col. 34 mentions that the routing system monitors a routing table for congested links for links which have been utilized beyond a predetermined threshold. Nowhere does this cited col. 34 anywhere teach or suggest the claim requirement of indicating one disabled path as enabled after performing a threshold number of transfer operations. Further, nowhere does the cited col. 34 anywhere teach, suggest or mention enabling a path after performing a threshold number of operations. Instead, the cited col. 34 mentions monitoring for links that have been utilized beyond a predetermined threshold, and says nothing of the claim requirement of enabling a path after performing a threshold number of operations.

Accordingly, claims 2, 16, and 30 provide additional grounds of patentability over the cited art.

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

Claims 3, 17, and 31 depend from claims 2, 16, and 30 and further require disabling the path for a first threshold number of transfer operations if the path has a transfer data time satisfying a first threshold and disabling the path for a second threshold number of transfer operations if the path has a transfer data time satisfying a second threshold. The Examiner cited col. 35, lines 1-13 of Ben-Ami as teaching the additional requirements of these claims. (Office Action, pg. 3) Applicants traverse for the following reasons.

The cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Nowhere does the cited col. 35 anywhere teach, suggest or mention the claim requirements of disabling a path for a first or second threshold number of transfer operations depending on whether the path has a data transfer time satisfying a first or second thresholds, respectively. Instead, the cited col. 35 only mentions that a link expander may expand the congested links and have information on congested links utilized beyond a threshold. There is no mention in the cited col. 35 of disabling a path for a certain number (first or second threshold number) of threshold operations depending on the transfer data time satisfying a certain (first or second) threshold. The cited col. 35 does not teach, suggest or mention the specific requirements of these claims for disabling paths.

Accordingly, claims 3, 17, and 31 provide additional grounds of patentability over the cited art.

Claims 4, 18, and 32 depend from claims 1, 15, and 29 and further require that transfer time data is gathered by path and transfer size, wherein a path is disabled for a given transfer size and wherein one path disabled for one transfer size is capable of being enabled for at least one other transfer size. The Examiner cited pg. 28, paragraphs 365-367 of Bare as teaching the additional requirements of these claims. (Office Action, pg. 3)

The cited pg. 28, paragraph 365 mentions that when a link comes up for the first time, the port will become the broadcast link if no other ports received the cost packet. This moves paths

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

to ports with the lowest current latency. Nowhere does paragraph 365 anywhere teach, suggest or mention gathering transfer time data by path and transfer size and that a path is disabled for a given transfer size. Instead, the cited paragraph 365 mentions how a port becomes the broadcast link.

The cited paragraph 366 mentions that in one case, when the switch receives the cost criteria, it will delete the current broadcast path and return an ACK, and the ACK of the cost packet must wait until the delete has been confirmed. The cited paragraph 367 mentions that in the second case it is possible the cost packet went through an adjacent switch dependent on this switch broadcast path, and for this reason the switch cannot merely move the broadcast port.

Nowhere in the cited paragraphs 366 and 367 is there any teaching, suggestion or mention of gathering transfer time data by path and transfer size and that a path is disabled for a given transfer size. Instead, these paragraphs 365-367 discuss something entirely different and nowhere mention the specific requirements concerning gathering transfer time data.

Accordingly, claims 4, 18, and 32 provide additional grounds of patentability over the cited art.

Claims 5, 19, and 33 depend from claims 1, 15, and 29 and further require that gathering transfer time data further comprises: for each enabled path, gathering a cumulative transfer time for all transfer operations during a measurement period through the path and a cumulative number of the transfer operations during the measurement period; and for each enabled path determining the average cumulative transfer time for the measurement period by dividing the cumulative time by the cumulative number of transfers, wherein the path is indicated as disabled if the average cumulative transfer time for the path satisfies the threshold. The Examiner cited col. 35, lines 1-12 of Ben-Ami as teaching the additional requirements of these claims. (Office Action, pg. 4) Applicants traverse for the following reasons.

The cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

Nowhere does the cited col. 35 anywhere teach, suggest or mention gathering a cumulative transfer time for all transfer operations during a measurement period through the path and a cumulative number of the transfer operations during the measurement period. Instead, the cited col. 35 just mentions information regarding congested links, but nowhere teaches or suggests a cumulative transfer time for all transfer operations and a cumulative number of transfer operations for a path for a measurement period.

Further, nowhere does the cited col. 35 anywhere teach, suggest or mention that the path is indicated as disabled if the average cumulative transfer time for the path satisfies the threshold. Instead, the cited col. 35 mentions that the link expander expands the congested or beyond threshold utilized links. Nowhere is there any teaching or suggestion of disabling a path based on average cumulative transfer time as claimed.

Accordingly, claims 5, 19, and 33 provide additional grounds of patentability over the cited art.

Claims 6, 20, and 34 depend from claims 5, 19, and 33.

The Examiner cited col. 3, lines 31-42 of Ben-Ami as teaching the claim requirements that the measurement period comprises a number of transfer operations for all paths, wherein the determination to disable paths occurs after the number of transfer operations in the measurement period has occurred. (Office Action, pg. 4) Applicants traverse.

The cited col. 3 discusses allocating traffic by selecting a candidate route, and how to search for a switch which would be blocking at the service level if the inactive link were activated, and which would cause the switch to not be blocking if the current inactive link were activated.

Nowhere does the cited col. 3 of Ben-Ami anywhere teach, suggest or mention the claim requirement that the measurement period comprises a number of transfer operations for all paths. Instead, the cited col. 3 discusses how to select a switch that although blocking at the service level has an unused active link which if activated would not be blocking at the service level. Applicants submit that this cited col. 3 does not teach, suggest, mention or concern the claim

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

requirements that the measurement period comprises a number of transfer operations. Further, nowhere does the cited col. 3 anywhere teach or suggest the claim requirement that the determination to disable paths occurs after the number of transfer operations in the measurement period has occurred.

The Examiner cited col. 35, lines 1-12 as teaching the claim requirement of starting another measurement period to gather transfer time data after determining paths to disable. (Office Action, pg. 4)

The cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Nowhere does the cited col. 35 anywhere teach, suggest or mention starting another measurement period to gather transfer time data after determining paths to disable. Instead, the cited col. 35 discusses expanding congested links.

Accordingly, claims 6, 20, and 34 provide additional grounds of patentability over the cited art.

Claims 7, 21, and 35 depends from claims 1, 15, and 29 and further requires that the transfer time data is gathered by path and transfer size, and wherein the average cumulative transfer time is calculated for each enabled path and for at least one transfer size. The Examiner cited col. 35, lines 1-12 as teaching the additional requirements of these claims. (Office Action, pg. 5) Applicants traverse for the following reasons.

As discussed, the cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Nowhere does the cited col. 35 anywhere teach, suggest or mention that transfer time data is gathered by path and transfer size, and that the average cumulative transfer time is calculated for each enabled path and for at least one transfer size. Instead, the cited col. 35 discusses

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

information regarding congested links, but nowhere mentions this information comprises transfer time data gathered by path and transfer size.

Accordingly, claims 7, 21, and 35 provide additional grounds of patentability over the cited art.

Claims 8, 22, and 36 depend from claims 7, 21, and 35 and include many of the requirements of claims 6, 20, and 34, as well as additional requirements. The Examiner cited the same sections of Ben-Ami against claims 8, 22, and 36 that were cited against claims 6, 20, and 34. Applicants thus submit that claims 8, 22, and 36 are patentable over the cited Ben-Ami for the reasons discussed with respect to claims 6, 20, and 34 and because the additional requirements of claims 8, 22, and 36 provide further grounds of distinction over the cited art.

Claims 9, 23, and 37 depend from claims 5, 19, and 33 and further require that the transfer time is measured from the time the transfer is sent to the device to the time a response is received from the device indicating that the transfer completed, further comprising adding the transfer time for a transfer transmitted down the path to the cumulative transfer time for the path. The Examiner cited col. 34, lines 36-64 as teaching the additional requirements of these claims. (Office Action, pg. 5) Applicants traverse for the following reasons.

The cited col. 34 discusses expanding link capacities by a maximal factor, that saturates both interswitch links and the switches. The cited col. 34 discusses an apparatus including a conventional routing system that may be centralized or distributed, which allocates traffic to a network. The routing system is monitored.

1 (Nowhere in the cited col. 34 is there any teaching or suggestion that a transfer time is measured from the time the transfer is sent to the device to the time a response is received from the device indicating that the transfer completed, and that the transfer time for a transfer transmitted down the path is added to the cumulative transfer time for the path. Nowhere does the cited col. 34 anywhere teach, suggest or mention a cumulative transfer time for a path as claimed.)

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

Accordingly, claims 9, 22, and 37 provide additional grounds of patentability over the cited art.

Claims 10, 24, and 38 depend from claims 5, 19, and 33.

The Examiner cited page 40, col. 512 of Bare as teaching the claim requirement that for each enabled path, a best average transfer time is determined from the average cumulative transfer times for all paths. (Office Action, pg. 5) Applicants traverse.

The cited page 40 of Bare mentions redistributing MAC addresses when a load balance link is dropping packets. In this case, when the switch detects packet drops, it will check for another path that is not dropping packets. The switch can then remove one or more MAC addresses from the overloaded link. The cited page 40 further mentions that since the path currently dropping packets will typically not be the best path. Further, the MAC address to delete should have a lower cost path and must not be a path dropping packets.

Nowhere does the cited page 40 of Bare anywhere teach, suggest or mention that for each enabled path, a best average transfer time is determined from the average cumulative transfer times for all paths. The cited page 40 mentions that the path currently dropping packets will not be the best path. However, the cited page 40 nowhere mentions an average cumulative transfer time for all paths nor mentions determining a best average transfer time from the average cumulative transfer time for all paths.

The Examiner cited col. 35, lines 1-12 of Ben-Ami as teaching the claim requirement that determining whether the average cumulative transfer time for one path satisfies the threshold comprises determining whether the average cumulative transfer time for the path exceeds the best average transfer time by a percentage amount.

As discussed, the cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Although the cited col. 35 discusses information regarding congested links, nowhere is there any teaching, suggestion or mention of determining whether the average cumulative

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

transfer time for the path exceeds the best average transfer time by a percentage amount. There is just no mention in the cited Ben-Ami of an average cumulative transfer time for paths or determining whether such time exceeds a best average time by a percentage amount.

Accordingly, claims 10, 24, and 38 provide additional grounds of patentability over the cited art.

Claims 11, 25, and 39 depend from claims 10, 24, and 38 and further require that determining whether the average cumulative transfer time satisfies the threshold further comprises disabling the path for a first number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a first percentage amount and disabling the path for a second number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a second percentage amount. The Examiner cited col. 34, lines 64-67 and col. 35, lines 1-12 of Ben-Ami as teaching the additional requirements of these claims. (Office Action, pgs. 5-6) Applicants traverse for the following reasons.

The cited col. 34 mentions that the routing system monitor searches the routing table for congested links, or links utilized between a predetermined threshold of utilization. Although, the cited col. 34 generally mentions searching for congested links, nowhere does the cited col. 34 anywhere teach or suggest the specific claimed determinations, such as disabling the path for a first number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a first percentage amount and disabling the path for a second number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a second percentage amount. These specific requirements are just nowhere mentioned in the cited col. 34.

As discussed, the cited col. 35 mentions that information regarding congested links utilized beyond a threshold is provided to a link expander. The link expander may expand the congested or beyond threshold utilized links and provide updates regarding expanded links.

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

Although the cited col. 35 mentions expanding a congested link, nowhere does the cited col. 35 anywhere teach or suggest the specific claimed determinations, such as disabling the path for a first number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a first percentage amount and disabling the path for a second number of transfer operations if the average cumulative transfer time for the path exceeds the best average transfer time by a second percentage amount. These specific requirements are nowhere mentioned in the cited col. 35.

Accordingly, claims 11, 25, and 39 provide additional grounds of patentability over the cited art.

Claims 13, 27, and 41 depend from claims 11, 25, and 39 and further require that transfer time data is gathered by path and a size of the update, wherein a path is disabled for a given update size and wherein the path is capable of being enabled for at least one other update size. The Examiner cited pg. 20, para. 266 of Bare as teaching the additional requirements of these claims. (Office Action, pg. 6) Applicants traverse for the following reasons.

The cited pg. 20 mentions that when a switch port receives a cost packet it updates its tables and sends out an acknowledgment. To update its tables, the switch will first add the outbound queue cost for the port it received the packet on to the switch referenced in the packet. The cost information is then used to update the switch cost table.

Although the cited pg. 20 mentions updating a table with a queue cost, nowhere does the cited pg. 20 anywhere teach, suggest or mention that transfer time data is gathered by path and a size of the update, wherein a path is disabled for a given update size and wherein the path is capable of being enabled for at least one other update size. These specific claim requirements are nowhere mentioned or suggested in the cited pg. 20.

Accordingly, claims 13, 27, and 41 provide additional grounds of patentability over the cited art.

Amdt. dated November 28, 2003
Reply to Office action of August 27, 2003

Serial No. 09/591,024
Docket No. TUC92000014US1
Firm No. 0018.0075

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-42 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0466.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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